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## Technology and Its Impact on Physical Education

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Technology and Its Impact on Physical Education

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A Literature Review Presented

in Partial Fulfillment of the Requirements

For the Degree of Master of Education

April 19, 2020

Dr. Ashley Nashleanas

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### Abstract

This literature review discusses the necessity of technology in physical education classrooms. The review first looks at the history of technology in education and the theoretical framework of technology in physical education. Then the review will discuss the impacts of implementing technology into the physical education classroom including the positive and the negative impacts. Today there are teachers who believe technology should be in physical education and there are others who believe it should not be implemented in physical education. The review will also discuss the teacher's role in technology in physical education. Technology in physical education classrooms can help keep students engaged in the lesson which will increase participation and decrease the amount of undesired behaviors.

### Technology and Its Impact on Physical Education

Technology is ubiquitous. According to a 2017 survey from the Consortium for School Networking, 40 percent of districts in the U.S. were one-to-one, which is nearly twice as many as in 2014 (Medlin, 2019). Technology is changing things in schools, including physical education classes. According to Hanski (2016), technology is helping students' physical education experience change their sedentary lifestyles into physically active and fit lifestyles. Technology is certainly positively impacting students' learning and their health. A handful of researchers still question whether or not technology has a place in physical education classrooms. Gard (2015) stated that he was concerned about the use of digital technology in physical education and how it could marginalize physical education teachers' roles. Wyant (2018) expressed how he could see that arguments against technology in physical education are logical, but they sometimes fail to point out how technology can help and support these teachers. There is certainly a fine line of when technology becomes more of a distraction rather than a support or resource.

Integrating technology can be more difficult in some school classrooms than others. Physical education class is an example of such classroom. Mikat and Anderson (2005) state that the most difficult parts about integrating technology into physical education classrooms are the features and the cost of the technology. Another point that Mohnsen (2012) brings up in her book is that studies specific to technology in physical education have been limited and more research is much needed in this area. This research is needed in order for more physical education teachers to be able to integrate technology into their physical education classrooms and feel confident in the fact that technology is positively impacting their classrooms. A handful of technologies could be integrated into physical education classes, but teachers struggle with finding a great piece of technology that helps their students learn and at the same time does not

distract from the lesson. According to Baek (2018), the reasons physical education teachers struggle to implement technology are access to technology, lack of training and time to learn, and perceived value of technology integration. Some schools lack the funds to give their physical education teachers access to technology and the time off to receive proper technology training. Junhyung Baek completed a study in 2018 on physical education teachers and their perceptions of technology. In Baek's study, twelve physical education teachers completed a survey and engaged in individual interviews. The results indicated that teachers perceived there is an absence of technology in K-12 physical education, and that any technology integrated into a physical education classroom needs to be dynamic, authentic, and tailored for physical education classes. Technology can become a distraction in the classroom and the physical education classroom if it is allowed to become a distraction. There are certainly benefits to implementing technology, and it does impact the classroom. This study will focus on the implementation of technology into physical education and the impact it has on the students and their behaviors.

Technology is universal in education, but it seems to be lacking in physical education classrooms. Does the use of technology in physical education classes increase student engagement and participation and decrease the amount of undesired behaviors from students? Based on this literature review, I hypothesize that the use of technology in physical education classes may increase student engagement and participation and decrease the amount of undesired behaviors. The purpose of this literature review is to show how technology impacts physical education classes. This literature review will address how technology impacts physical education classes, including the benefits and the negatives to having technology in physical education classes. This literature review will look at historical evidence and theoretical framework, the themes throughout the literature, and areas where further research needs to be conducted.

### **Review of the Literature**

Technology has been around for a while, but it is always new in education because it is continually changing. For example, according to Avedisian (2019), there were four emerging technologies that were new to education in 2019 and still reshaping technology. Those technologies were 5G, Mobile AR, Voice and Future Inferences, and Artificial Intelligence. Totoraitis (2018) discussed how technology is continuously changing, so we need to be constantly learning. Physical Education teachers struggle to implement technology for multiple reasons. According to Hyndman (2019), the reasons teacher struggle to implement technology are the following: technology becomes a distraction for students, teachers need more professional development, and technology can affect lesson time and flow. Using the right technology, being trained correctly, and planning out your lessons can help avoid these struggles and allow teachers to implement technology into the classroom. It is important to have technology in physical education classes because it motivates and energizes students and allows students to connect physical education classes with the outside world even more, according to McVicker (2018). This literature review will cover the history of technology in education, positive impacts of technology in education, negative impacts of technology in physical education, and the teacher's role in implementing technology into physical education classes.

According to Jones (2019), technology has been married to education for decades, and it is vital to education. Technology started in the 1800s as chalkboards and slide rules then moved into pencils, paper, and film projectors in the 1900s (Gray, 2019). In 1963, the Vocational Education Act funded the use of technology in schools; that would be the time where technology really started to be seen in education. (Christensen, 2019) After 1963, PCs were in classrooms, and programming was beginning to be taught to students. By the mid-1980s, Apple computers

started to be a more common sight in classrooms. A decade later the Internet connected computers across the globe. In the early 2000s, STEM (science, technology, engineering and mathematics) became the main focus of schools. Now today the focus is more on the ISTE standards. (Christensen, 2019) Technology and the use of technology has changed a lot through the years as shown above. Bernstein stated more than 50 percent of teachers have one-to-one student-to-device ratio in 2017. According to EdTech (2019), that number has now risen to 75 percent. The number increased by 25 percentage points in two years, and it is interesting to wonder what that number will be like in another two years.

### **Theoretical Framework of Technology in Physical Education**

Eberline and Richards (2019) wrote an article about their study of technology in physical education and how technology was first introduced into physical education classes as pedometers and using projectors to explain games. They also discussed in their article about how physical education teachers started implementing these technologies to try to keep students engaged and also to maximize their efficiency in the short time allowed for physical education. In Eberline and Richards' article, they also interviewed and studied other physical education teachers and how they use technology in their classrooms. One of these teachers was Rick Schupbach. He has used a variety of heart rate monitors, pocket PCs, and activity watches to assess his students. When he first started teaching, he used a projector to present key concepts, skill cues, and videos to his students to teach his lessons in a different way. His theory was that by using technology it would increase student engagement because it was a different way of learning and that might appeal more to some students. In turn, they would become more engaged.

One other physical education teacher they talked about was Brian Carr. He uses heart-rate monitors and iPads for his physical education classes. The motivation behind his use of



technology in his classroom is that the students can use the iPads, record themselves, and then receive immediate feedback on their skill development. The other part of his motivation is then he also has documentation of their learning. Carr's school is one-to-one with iPads to students, which makes it very easy for him to have his students use the iPads in his physical education classroom to do things such as video record skills and receive immediate feedback. With the immediate feedback, he spends less time instructing the same thing, students learn at a faster rate, and students are more engaged in what is going on. He also has a projector system, which allows him to display visual components to what he is instructing.

Klara Gubacs wrote an article in 2004 about integrating technology into physical education. In this article Gubacs defined student engagement as students meaningfully partaking in learning activities and are cooperating and actively learning. She goes on to talk about in her article how if teachers were to implement technology with a student-centered approach and with instructional strategies that increase student engagement, teachers would be able to notice a difference in student behavior and student engagement. Gubacs goes on to talk about a study done at Montclair State University, where students were assigned a project that required the use of technology and also included different sports. The students were required to record a segment of a class and focus their footage on the main aspects of the tactical lessons. Then the students had to edit the footage and create videos of the learning segment with the main aspects highlighted. The professor of this class conducted this project for several reasons. Those reasons included the students learned how to effectively use technology, the professor could assess the students' mastery of the content knowledge involved, and the teacher assess the effectiveness of the teaching strategy that was being used in the video. Gubacs also explained how the use of

project-based learning and technology together could really benefit both the student and the teacher.

### **Impacts of Technology in Physical Education**

**Positive impacts of technology in physical education.** A 2019 study conducted by Lucena, Belmonte, Cabrear, Torres, and Sánchez showed many positive effects on flipped learning including some positive academic effects. Students in the study, who were taught through flipped learning, started showing noticeable improvements in the academic aspects of motivation, autonomy, critical thinking, problem solving, the use of class time, interactions with teachers and peers, content and tests. The use of flipped learning not only benefited the students academically, but it also benefited them physically. Their findings showed that using the technology in physical education can motivate and attract adolescents to physical education due to the use of technology. They also found that it would decrease the sedentary lifestyle we see in the world today. Lucena, Belmonte, Cabrear, Torres, and Sánchez investigated the two dimensions of attitudinal and interactive and how flipped learning and the use of technology would impact those two dimensions. Their results showed that in both of the dimensions the group that experienced flipped learning and technology exceeded their peers, who received instruction using a more traditional approach. The researchers stated that they saw the most increase in these two dimensions from the students, who received flipped learning, in the category of interactions of students with their teacher and their peers. In other words, the use of technology and flipped learning in physical education increased the interactions between students and teachers.

Mohnsen (2012) remarked on another positive impact that technology brings into the physical education classroom. She talked about how some devices and technology used in

physical education supply students with additional information and supports to help them understand the concepts of the lesson. Mohnsen also states that technology is there to support what we are already doing and not take over the classroom for us. In her book, she talks about five more positive reasons why we should use technology. Those five reasons are motivation, unique instructional capabilities, support for new instructional approaches, increased teacher productivity, and skills for an information age. Mohnsen talks about how learners stay more attentive and actively engaged via the use of technology. She also talks about how it increases the abilities of teachers by allowing them to have unique instructional capabilities and by allowing them access to all kinds of support for new instructional approaches. Teacher productivity increases because the technology allows them to have more free time to work with the students and teachers can find more accurate information more quickly.

Another study about the impacts of technology in physical education was completed by O'Loughlin, Chróinín and O'Grady (2013). This study was specifically focused on the use of digital video to complete assessments in physical education. The study was completed by observing and interviewing nine- and ten-year old's in physical education classes and how the use of digital video to assess their basketball skills would impact them. The results from this study were similar to most of the studies talked about previously in this paper. The researchers found the students became more motivated and enthusiastic about the skills they were currently learning. The study also showed the students became more self-aware of the skills they were performing and what they needed to change in order to perfect their skills even more.

**Negative impacts of technology in physical education.** Alghamdi (2016) wrote on the negative effects of technology on children. In this paper, he brought up many reasons why technology negatively impacts children. According to Alghamdi, technology adversely effects

their personal lives, their relationships with others, and their health in the future. Alghamdi explains more in detail about how technology leads children to social isolation and can bring up some serious physical and mental diseases such as, obesity and depression. He also goes on in his writing to explain how technology can lead to a condition called neurosis. According Alghamdi, he briefly describes neurosis as a psychological and behavioral disorders with symptoms such as anxiety, sadness or depression, anger, mental confusion, and low self-worth. Alghamdi goes on to talk about how the children will also develop a very low self-worth because they have spent all of their time socially isolating themselves and they do not really know what they are talented in because they haven't tried many other things. One of the last things Alghamdi talks about is that there is a correlation between time spent by children on technology and their body mass index. Alghamdi states that the more technology a child is using the more likely they are to have a higher body mass index, which can lead to multiple serious health issues.

Casey, Goodyear, and Armour (2016) wrote about how using digital technology in physical education can have negative impacts on the students such as the body images that are being presented to the students and the digital footprints the students are bringing into existence by using the technology. Casey, Goodyear, and Armour go on to write about how most of the people who are in the exercise videos or on other types of exercise technology are very fit, muscular, and healthy looking. When teachers use these in their classrooms, some students could take it as an ideal image that they should be striving towards. This can negatively affect the students because then they can become obsessive and addictive and that can turn into unhealthy behaviors. The authors go on to explain that they know it is not the teacher's intent to make this

happen, but it is something to be aware of before fully integrating technology into your classroom because of the negative affects it has on students.

The other negative impact Casey, Goodyear, and Armour talk about is the student's digital footprint. The authors talk about how there is a lot of information on the Internet and if we bring technology into physical education and health and allow students to research information on those topics, it could bring about a negative digital footprint that we would not want our students to create. The authors continued on to talk about how it could be digital images, and personal data about the body and/or a child's health the students could come across or the data they could give out and it is a huge risk to take. They really focus on figuring out whether the risk is worth the reward when bringing different technologies into the physical education classroom.

### **Teacher's Role in Technology in Physical Education**

A teacher's attitude toward the use of technology greatly influences the amount of technology being used in the classroom (Gibbone, Rukavina, and Silverman, 2010). A study was done by these three to determine the relationship between the teachers' attitudes and roles when it comes to technology in the physical education classroom. The results of the study showed that the teachers who had a learning attitude toward technology used technology to supplement what they were teaching in their classes. The other result of the study showed that teachers, who do not want to put much effort into the technology in their classrooms, ended up in a role where technology was not adding to their lesson, but was becoming a distraction and was taking away from what the students were supposed to be learning. Gibbone, Rukavina, and Silverman stated that it is important for teachers to see technology as an asset to them and it is there only to supplement their lessons and not be a distraction or be the whole lesson itself. Physical education

teachers do not want their jobs to become marginalized by the technology that they are using in their classrooms, and they also do not want them to become a distraction. The advice the authors give to physical education teachers about their role and attitude when it comes to technology in their classrooms is to research technology and pick which piece of technology fits their classroom the best and continue to have an open mind about what other technologies could come about for physical education classrooms.

Casey, Goodyear, and Armour (2016) wrote about how any technology a teacher picks to use in their physical education classroom must have a focus on the role of the teachers because teachers have the greatest impact on students and students' learning. The authors go on to discuss much of the same things that Gibbone, Rukavina, and Silverman discussed in the fact that the teacher's role is to determine what technology to use in their classroom, but at the same time continue to be the teacher and not let technology overrule them. The authors are not saying that teachers cannot use a video instruction once in a while, but for a majority of the time the teacher should be the one teaching and using the technology as something that supplements their lessons. Enright and Gard (2015) state that physical education teachers do not want to let their jobs become marginalized by technology. Their discussion goes along with Casey, Goodyear, and Armour's point about how teachers have the greatest impact on the students and their learning so they cannot be replaced by technology.

Another role for physical education teachers that has not been mentioned yet was discussed in an article by Yaman (2008) and that was that if a physical education teacher is going to bring technology into their classroom then they need to be in a role that they know a lot about this piece of technology. This role is a little bit different than the previous two roles mentioned, but it is still important according to Yaman because a physical education teacher cannot find a

piece of technology and implement it into their classroom without looking into it and filling the role of knowing quite a bit about it. The teacher needs to know what problems could come about with using this technology and they especially need to know how it is used and what their role is when the students are using this technology.

### **Conclusion**

From the evidence provided, there are a lot of positive impacts and outcomes of integrating technology into the physical education classroom. Technology is ubiquitous in our world today. Using the right technology in physical education can motivate students, get them engaged in what they are learning, and can help them understand what they are learning even better. When students are engaged and motivated, teachers will see a decrease in the amount of undesired behaviors and an increase in participation. Physical education with the help of technology can change students' lives from being sedentary to having the students become more deeply involved in physical activity experiences (Hanski, 2016).

Physical education is necessary for children to have in schools. With the help of technology students can become more motivated and engaged in physical education and physical activity. In turn, technology in physical education will make them healthier individuals and that is the main goal of physical education. Like most things, technology has some positive impacts and some negative impacts. It is very important to be cautious about the negative impacts technology could have on students. It is also important to remember that technology has multiple positive impacts in physical education classrooms and physical education teachers need to start advocating to implement and integrate technology into their physical education classrooms, so they can see the long-lasting benefits that it would bring to them and their students.

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